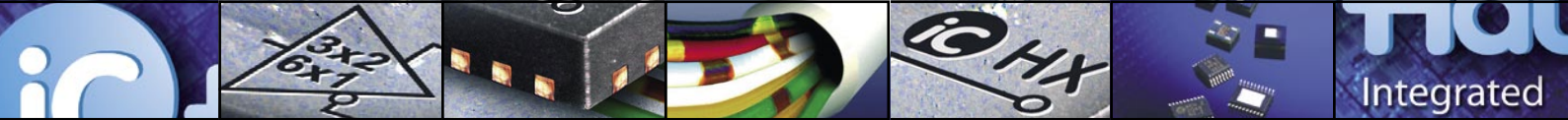


# iC-HX 3-CHANNEL DIFFERENTIAL LINE DRIVER



iC-HX is a RS422 to 24 V line driver featuring a power reduction circuit recycling reflected energy from non-terminated lines.

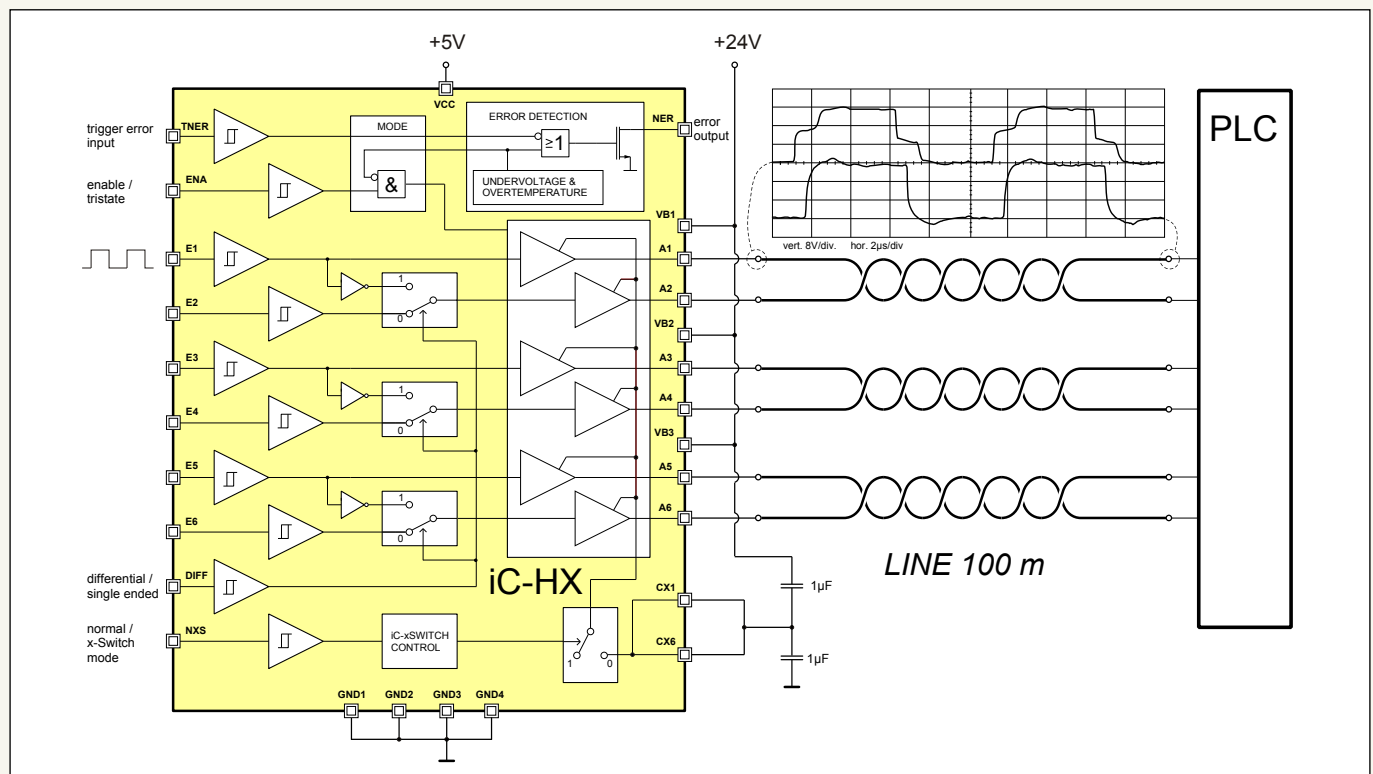
An internal switch is used to transfer residual energy to and from externally connected capacitors. This xSWITCH mode is active when pin NXS is set to low. In the non-active mode (NXS=high), the iC-HX is fully functional and pin-compatible to iC-DL.

## Applications

- 24 V control engineering
- Line driver in a PLC environment
- Linear and rotary encoders
- MR sensor systems

## Features

- Novel power loss reduction mode extends 24 V line driving capabilities
- 6 current-limited push-pull drivers
- Differential 3-channel operation
- Power supply range from 4 to 36 V
- Integrated 75  $\Omega$  line adaptation
- Low output saturation voltage
- Compatible with TIA/EIA standard RS-422
- Tristate switching enables use in buses
- Short switching times and high slew rates
- Schmitt trigger inputs compatible with TTL and CMOS levels, voltage-proof up to 36 V
- Thermal shutdown with hysteresis
- Open-drain error output with thermal shutdown / undervoltage
- Footprint compatible to iC-DL





# iC-HX 3-CHANNEL DIFFERENTIAL LINE DRIVER

The six independent output channels feature each a wave impedance adaptation to match 40 to 130 Ω lines and can be paired for differential 3-channel operation.

The push-pull output stages have been designed to cope with a high driver power of typically 300 mA from 24 V; they are current-limited and short-circuit-proof, shutting down with excessive temperature.

All inputs are CMOS- and TTL-compatible and protected against ESD. A high signal at input DIFF switches the three pairs of channels to differential operation, deactivating inputs E2, E4 and E6.

For bus applications the output stages can be switched to high impedance using the ENA input.

iC-HX monitors both supply voltages VB and VCC and the chip temperature, switching all output stages to high impedance in the event of error. Open collector output NER reports the above errors to the connected line. The error input TNER can be linked to the message outputs of other ICs to transfer system error messages to the PLC.

## Key Specifications

### General

Driver Supply Voltage	+4 to +36 V
Input Supply Voltage	+4 to +5.5 V
Output Current	+/-800 mApk, +/-30 mAdc
Output Short-Circuit Duration	Indefinite
Operational Temperature Range	-40 °C to +125 °C

### Driver Outputs A1..6

Saturation Voltage high/low	max. 0.2 V @ IL = 10 mA max. 0.4 V @ IL = 30 mA typ. 0.5 V @ IL = 50 mA
Short-Circuit Current	max. 800 mA
Output Impedance	typ. 75 Ohm @ 24 V
Slew Rate high	typ. 200 V/μs @ 100 pF
Slew Rate low	typ. 200 V/μs @ 100 pF
Propagation Delay	max. 400 ns
Delay Skew	max. 100 ns

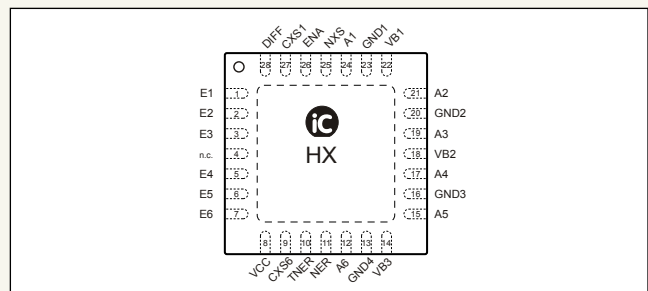
### Error Output

Undervoltage Detection Threshold	min. 3 V @ VB/VCC
Thermal Shutdown Threshold	min. 145 °C
Saturation Voltage low	0.4 V @ 5 mA
Short-Circuit Current	max. 20 mA

## Pin Functions

No.	Name	Function
1...3	E1...E3	Input Channel 1 to 3
4	n.c.	-
5...7	E4...E6	Input Channel 4 to 6
8	VCC	+4 to +5.5 V Supply Voltage
9	CXS6	Capacitor iC-xSwitch
10	TNER	Error Input
11	NER	Error Output
12, 15	A6, A5	Output Channel 6 and 5
13, 16	GND4, GND3	Ground 4 and 3
14, 18	VB3, VB2	+4 to 36 V Power Supply Voltage
17, 19	A4, A3	Output Channel 4 and 3
22	VB1	+4 to 36 V Power Supply Voltage
20, 23	GND2, GND1	Ground 2 and 1
21, 24	A2, A1	Output Channel 2 and 1
25	NXS	Enable iC-xSwitch, low active
26	ENA	Enable Input
27	CXS1	Capacitor iC-xSwitch
28	DIFF	Differential Mode Selection Input

## Pin Configuration QFN28 5x5 mm<sup>2</sup>



## Power Dissipation

